



DGUS_SDK User Guide_V5.1

Beijing DWIN Technology Co., Ltd.



DGUS SDK User Guide V5.1

4 1. DGUS_SDK Instruction..... 1.1 Operation of DGUS_SDK.......4 2.1.1 Start a new project 2.5 Download 14 3.2.16 Timer Variable 45 Beijing DWIN Technology Co., Ltd. www.dwin.com.cn

DWIN Professional, Creditable, Successful	DGUS_SDK User Guide V5.1
4.2 Command Set	47
4.3 Register	
4.4 VP & SP	
4.4.1 VP (Variable Pointer)	
4.4.2 SP (Stack Pointer)	51
4.5 Examples	53
4.5.1 Access Register of DGUS	54
4.5.1.1 Write Data into Register	54
4.5.1.2 Read Data from Register	54
4.5.1.3 Response from the DGUS module	
4.5.2 Access Variable SRAM	55
4.5.2.1 Write Data into variable SRAM	
4.5.2.2 Read Data from variable SRAM	
4.5.2.3 Response from the DGUS module	
4.5.3 Dynamic Trend Curve Display	
4.5.4 Basic Graphic Display	

3

1. DGUS SDK Instruction

1.1 Operation of DGUS_SDK

rechnoloc. (1) DGUS (DWIN Graphical Utility Software) is an intelligent GUI design software for DWIN DGUS LCM with K600+ kernel. As be helpful to interface of display design faster than ever, diversified display effects can be achieved easily and rapidly with much less programming. The variables in use are defined by software DGUS SDK v5.1 that is accessed by controller via address. All parameters and images can be downloaded via SD card which stores related .bin files to make your design into real application.

(2) Install DGUS_SDK_V5.1:

Unzip DGUS SDK V5.1.zip, and click DGUS ToolV5.1.exe to run it.

(.net Framework 2.0 is required to run the software).



(3) Variable Definition

∻ VP (Variable Pointer): The addresses of variables in variable SRAM (56KB). Users can set buttons with defined VP, to change the value in this address and display contents corresponding with the value in VP address.

 \diamond SP (Stack Pointer): the address of definitions, starting address of description data of variables. Change the value in particular address to modify variable properties. Take <WordArt> function as example.

Add.		Definition	Data Length	Description
0x00		0x5A03	2	
0x02		*SP	2	Stack pointer, default setting is 0xFFFF.
0x04		0x0007	2	The whole process length (in terms of words).
0x06	0x00	*VP	2	Variable pointer.
0x08	0x01	X,Y	4	Top-left coordinate of text, left aligned.
0x0C	0x03	Icon0	2	Icon ID corresponding to 0, the sequence is "0123456789".
0x0E	0x04:H	Icon_Lib	1	Address of icon file.
0x0F	0x04:L	Icon_Mode	1	ICON display mode. 0x00: transparent, others: opaque.
0x10	0x05:H	Int_Num	1	Length of integer digits.
0x11	0x05:L	Dec_Num	1	Length of decimal digits.
0x12	0x06:H	VP_Data_Mode	1	0x00: integer (2 bytes), 0x01: long integer (4 bytes).

E.g.: If SP valued as 0x5000 for WordArt variable, VP parameter will be saved in the ADDRESS of 0x5000. Variable position parameters will be saved in 0x5001-0x5002

(4) If you need to handle with icons, please drop icon files into Icon Generator to make icon file running in DGUS correctly.

or

(5) How to select area for buttons & variables.

A. Input coordinates directly.

x	60	i i	Y	30	i i	Preview
W	94	-	н	63	÷	KEY CTRL

B. Drag the button/variable with mouse.



(6) Define SP address for variables.

Beijing DWIN Technology Co., Ltd.



DGUS SDK User Guide V5.1



DGUS_SDK User Guide V5.1

Professional, Creditable, Successful

SP defines the description of variable settings; to reduce overlap of SP address is necessary. There is overlap judging embedded, Configuration files won't be created with failure message when it comes an overlap of SP address.

s	P Con	f1	icted					×
	X	SI	? Settings	of	Picture	ID 4	and 4	conflicted!
					ОК			

- (7) Import existing DGUS config. files into new project.
- A. Create a new project.
- B. Add pictures.

DWIA

- C. Import config files.
- D. Copy icon files into <DWIN_SET> folder.

Note: Frame header is self-defined by users. In this document, A5 5A is taken as frame header for instance.

1.2 Main Interface of DGUS_SDK_V5.1

DWIN DGUS	×
BWIN Technology B B B B B B B B B B B B B	
Wetcome Manage a Project Mew Project New Project New Project New Project New Project Description Description 2DOUS Project DMari Inni	Default Parameters ✓ Data Auto Upload Fonts Font Color(0x) Font Lib_D 23 0,23.127 Font Size 16 4.255 ICON Display Mode
Dous ke	Transparent

a) Click <New Project> to activate the window below:

creen Proper	ty		
Resolution	800X480	Yixels 🖌	
Color 16	5-bit 🔽		
ave In			
):\My Documen	its		
	100 Mar		
lata: The	and and the second states	with the second dimen	4 T

b) Select resolution and path for your project.

Beijing DWIN Technology Co., Ltd.





Screen Property Set. E.g. for: DMT80480T070_06WT. Color T: 16bit. Resolution 80480: 800x480.

Navigation Bar:

Professional, Credita	able, Successful DGUS_SDK User Guid
creen Property Set.	
g. for:	-C ¹
1 <mark>T80480</mark> T070_06WT.	X 6
lor T : 16bit.	
solution <mark>80480</mark> : 800x480.	
lavigation Bar:	
New	Create a new project.
Open	Open an existing project (.hmi file).
Save	Save the current project.
Save As	Save the current project in a new folder.
Close	Close the current project.
Variables Preview	Preview buttons & variables
Resolution	Modify resolution of project.
Generating	Modify system configuration and save the settings in config.txt. Refer to illustration
Configuration file	below.
Import Config.	Import existing config. files to the current project.
Export Variables	Generate <touchconfig.xls> and <displayconfig.xls> for quick view of buttons &</displayconfig.xls></touchconfig.xls>
	variables.
System Properties	Modify system properties and save the settings in config.txt. Refer to illustration
	below
DGUS Configuration File	Download <13Touch_Control_Config.bin>, <14Variable_Config.bin>, and the image;
Download	debug commands via serial port.
Help	Help documents.
Align Left	Align the selected buttons and variables to left.
Align right	Align the selected buttons and variables to right.
Align Top	Align the selected buttons and variables to top.
Align bottom	Align the selected buttons and variables to bottom.
Auto Width	Adjust the selected buttons & variables at same width.
Auto Height	Adjust the selected buttons & variables at same height.
Vertical centered	Adjust the selected buttons & variables at the vertical center.
Horizontal centered	Adjust the selected buttons & variables at the horizontal center.
Сору	(Ctrl + C): copy
Paste	(Ctrl + V): paste
Delete	(delete): delete
Front	Place the button or variable at front layer.
Back	Place the button or variable at backward layer.
SP Address Setting	Set SP for variables.
Variables Preview	Preview buttons & variables
Show Text	show the names of buttons & variables or not.

Reference: Inputted data will be sent via serial port only when both <TPSAUTO> in System Config. Window and <Data Auto Upload> settings in buttons properties are ticked.



Switching between "Touch Config" & "Variable Config" & Edit Tools using Navigation bar, or shortcut key F2, F3,F4.

2. Basic Steps for DGUS_SDK Operation

2.1 Create a new project

2.1.1 Start a new project

Open the DGUS_SDK_V5.1-----> Click "New Project" button to start a new project.





DGUS_SDK User Guide V5.1

2.1.2 Select corresponding resolution and save the path

■ ● Image: Constraint of the state	n choice
Manage a Project Screen Property Set Screen Property Resolution 800X4 Color 16 800X4 Color 10	Jing Default Parameters Jing ✓ Deta Auto Upload S0 Y S0 Y Pixels ✓ O Pixels O Y Pixels ✓ O Y Pixels ✓ O Y Pixels ✓ Font Lib_D 23 O O Point Lib_D 23 O O O O If will be open if there had by in the selected path. folder. Maximum of variables in one page GK Cancel
No.0 Font Lab. Images Conversion DWIN ICO I This software is used for creating font type from position Number 4/98 64/478	Join Deurator Download via UART 0 in DGUS LCM, sizing from Unit of the size of th

2.1.3 Add images

DWIN

IMAGES				
\odot		٢	\odot	
Position	File			

Images indicating here are what to be displayed as background with ".bmp" format required.

Image naming rules: ID + Name. bmp (name as optional)

For example, "0_Data Input.bmp" or "0.bmp"



DWIN



DGUS_SDK User Guide V5.1

2.1.4 Create a CONFIG.TXT file for setting system parameters

Step into setting such system as baud rate, backlight, as well as cycle time etc.

🖹 💩 🖫 I	🖪 🗙 (0) 🖂 🖴	📩 📾 🗐 🗊	? Batch choice 🗾 🗸	₽ ॐ	
≣ 888 ≓ ⊠	$\Box \Box \odot \times \odot \Box$	🖲 🛈 🖸 🗹	M 🛊 🌣 🛃 🖂 두; 🕫 🛈	♦C BX >	
≣≣≡	🛃 System Config.				
Welcome B	R1(Baud Rate) 115200	Frame High Byte)	(0X00-0XFF) RA(Ser	Low Byte) (0X00-0XFF)	-
	VDS	HDS	TP_LED	FCRC	
Position File 00 00_00.k 01 01_01.k	 Normal Display 90° Rotation 	 Normal Display 180° Rotation 	 Backlight is not controlled by condition of touch screen Backlight is controlled by condition of touch screen 	Disable CRC16 frame check of serial communication. Enable CRC16 frame check in the serial communication	
02 02_02.k	TPSAUTO		L22_Init_En	Operational cycle time	
	 Touch screen input not automatically upl Touch screen input automatically upload port. 	parameters are loaded parameters led to the serial	The power-up initializing code of SEKB VAR memory is 0X00. Initiating according to the 22 (0x16) font library.	200ms 160ms 120ms 60ms	
	User-defined Baud Rate	Touch Control	Backlight Setting		
	R5(High Byte) 0X	R6(Backlight (ON Brightness) 0X (C OFF Brightness) 0X (C	0X00-0X40) 0X00-0X40)	
		R8(Backlight C	DN Time x1.0S) 0X ((0X00-0XFF)	
	Enable OS Enable touch calibration			Export Configuration File	
				Quick Default	roperty

Export Configuration File - "CONFIG. txt"

DWIN DU	GUS WIN Technology			
	Image: A state of the state	🋐 🕜 Batch choice 🛛 🔹 🔊	₽ ↔ ♦ C Ø % ⊃	X
Welcome Bit MAGES Image: Comparison of the position Image: Comparison of the position of the pos	R1(Baud Rate) 115200 R3(Serial-prame High STYS_CF6 Configuration Word.(R2) HDS VDS Normal Display 90° Rotation 180° Rotation TPSAUTO Touch screen input parameters are not automatically uploaded Touch screen input parameters automatically uploaded to the serial port.	oort (0X00-0XFF) RA(Seri Frame L Isy (0X00-0XFF) Frame L Isy Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Backlight is controlled by condition of touch screen Image: Condition of touch screen Backlight is controlled by condition of touch screen Image: Condition of touch screen Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Image: Condition of touch screen Im	ial-port .ow Byte) (0X00-0XFF) FCRC	LECT TIONS
	User-defined Baud Rate Touch R5(High Byte) 0X R6(Ba R9(Low Byte) 0X R8(Ba Enable OS Enable touch calibration	Control Bac 通定 0X 00 (0 cklight ON Brightness) 0X 00 (0 cklight OFF Brightness) 0X 00 (0 cklight ON Time x1.0S) 0X (0	IX00-0X40) IX00-0X40) IX00-0XFF) Export Configuration File	



For the value and functions of each parameters, please refer to the chapter 1.2 of the DGUS Dev. Guide_V5.1—CONFIG. TXT

Name of Parameter Register	Range	Range Description Depends Module driver mode, unnecessary for modification which may cause errors. Do not configure it.								
R0	Depends									rs. Do n
2		Baud rate setting, 0:	x00-0x	10 mat	chup w	ith 1200	ops -92	21600bps	i.	
	10 100000 000	R1 0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08
R1	0x00-0x11	Baud rate 1.2K	2.4K	4.8K	9.6K	19.2K	38.4K	57.6K	115.2K	28.8K
	~	Baud rate 76.8K	62.5K	125K	250K	230.4K	345.6K	691.2K	921.6K	Defined
	0	Dada Tale TO.OK	02.01	120K	LUGIN	200.41	040.01	UD1.2N	021.015	Denned
R2	0x00-0xFF	SYS_CFG configuration byte. Refer to the following table.								
R3	0x00-0xFF	UART_SYNC_H, High byte of frame header.								
R4	$ \geq $	Module driver mode, unnecessary for modification which may cause errors. Do no configure it.								
R5	0x00-0xFF	When R1=0x11, high byte of baud rate configuration. R5:R9=625000/user-defined baud rate. E.g.: set baud rate as 10000bps, R5:R9=6250000/10000=625=0x0271, R5=0x02 R9=0x71								
R6	0x00-0x40	Brightness of backling	ght.							
R7	0x00-0x40	Brightness of backli	ght in s	sleep m	node.					
R8	0x01-0xFF	Time before sleep m	node. a	ctivatio	n					
R9	In Flux	When R1=0x11, low	byte o	f baud	rate co	onfigurati	on.			
		UART SYNC L. Low byte of frame header.								
RA	0x00-0xFF	UART_SYNC_L, Lo	w Dyte	ornan						



Bit	Ratio	Definition			Description		
.7	0x80	VDS	0=Normal displation.	ay.			
.6	0x40	HDS	0=Normal Displ 1=180° Rotation	ay. 1 (upside down).		
.5	0x20	TP_LED	0=Brightness ca 1=Brightness ca R6, R7,R8	an't be changed an be changed	t via screen clic via screen clic	king king, the paran	neters set up in
.4	0x10	FCRC	0=Disable CRC 1= Enable CRC	16 checksum in 16 checksum in	n the serial com n the serial com	munication. munication	
.3	0x08	TPSAUTO	0=Disable auto- 1=Enable auto-	upload of key oupload of key of	code or data. code or data.		2
.2	0x04	L22_Init_En	0=Initialize 56K 1=Initialize 56K	B access varial B access varial	ble data to 0x00 ble data from 22	?*.bin.	00
.1	0x02	FRS1	Set the cycle o variable display	f DGUS, the s	maller number e efficiency of da	will shorten res	sponse time for
	00000000000	1000000 00000	Cycle	80mS	120mS	160mS	200mS
2	1		FRS1	1	1	0	0
-			FRS0	1	0	1	0
.0	0x01	FRSU	For the resolution The cycle influe	nce the speed	ecommended se of Animation Icc	et the cycle upor on display.	n 120mS.

R2 (SYS_CFG configuration Byte)

DWIN

If the frame header is set as R3=5A RA=A5, please use the software "Serial debugging assistant sscom32" sending command below for verifying all images works fine.

5A A5 04 80 03 00 01(00 01 signify images switching to No1.)

Later, check if images No1 switched successfully. (format must be .bmp naming started from"00").

There are config.txt failed or com port out of work in the event of images switch failure. Please affirm parameter for config.txt again including frame header, baud rate etc.

2.2 Configure touch functions

Select the "Touch Config" from pull-down menu-----> Add touch function, as "Data Input" -----> Drag a square on your button as follow yellow area ------> Set the properties, such as button effect, key value, etc.



Beijing DWIN Technology Co., Ltd.





DGUS_SDK User Guide V5.1



2.3 Configure variable display

DWIN

Select the "Variable Config" from pull-down menu -----> add the display function, as "Data Variable" -----> Drag a blue square on area, the variable will be displayed based on the upper-right coordinates.----> Set the properties of variable as font color, font ID.



DGUS_SDK User Guide V5.1

Professional, Creditable, Successful

2.4 Create configuration files

DWIN

Click the "Generating Configuration File" button, it will create a touch control configuration file and a variable configuration file. Their default file names are "13Touch_Control_Config.bin" and" 14Variable_Config.bin "which cannot be renamed, or the project can't be opened properly.

,0104

Please note that 13&14 bin file must be dropped in corresponding DWIN_SET folder if file downloaded via UART, otherwise pop-up red warning will show up warning correct file are not found.



DGUS_SDK User Guide V5.1

2.5 Download

deal par

When you completed above steps, it will create a DWIN_SET folder and a project named DWprj.hmi in the path you selected before.

1010133



The DWIN_SET folder includes as follow:

File Type	Naming Rule	Example	Description
Pictures	Picture ID+ (optional) file name.BMP	00_starting page.BMP	24-bit BMP pictures with same resolution of DWIN module are required
Fonts	Font ID+ (optional) file name.BIN/DZK/HZK	32_ASCII. DZK	Generated by the Font Generator
Icon Library	Icon file ID+ (optional) file name.ICO	41_iconlibrary. ICO	Generated by DWIN Toolbox "DWICON"
Default ASCII	0*.HZK	0_DWIN_ASC.HZK	Generated by DWIN Toolbox "No.0 font library".
Touch configuration	13*.BIN	13_touch configuration file.BIN	Generated by DWIN DGUS software
Variable configuration	14*.BIN	14_variables configuration file. BIN	Generated by DWIN DGUS software
Variables Initialization	22*.BIN	22_Initialization.BIN	
User Code	23*.BIN	23_Water_Treatment.BIN	
Hardware settings	CONFIG.TXT	CONFIG.TXT	



Copy the DWIN_SET folder into the SD card root directory -----> Powered on DGUS LCM-----> Insert SD card into the slot of LCM, the configuration files will be downloaded automatically.

Note: During downloading, don't turn off the LCM, the screen will blink to blue then back to the first image after completion

3. Main Functions of DGUS_SDK

Touch Config : users can use DGUS_SDK software to add buttons on screen, including Popup Window, Variable Data Input, Incremental Adjustment, Slider Adjustment, RTC Setting, Touch Control, Return Key Code, and ASCII Input. Buttons are shown as yellow rectangles in DGUS_SDK_V51. Users can also add press effect for buttons.

Variable Config : users can use DGUS_SDK to add variables on screen, including Variable Icon, Animation Icon, Slider, WordArt, Image Animation, Icon Rotation, Data Variable, Text Display, RTC Display, Analog Clock Display, Dynamic Trend Curve Display, Table Display, and Basic Graphic Display, Bit Icon, Timer Variable. Variables are shown as light-blue rectangles in DGUS_SDK_V51.

Parameter settings: users can use <System Properties> to adjust parameter settings of DGUS module. Parameter with "0x" in front should be filled with hex numbers.

3.1 Touch Config.

DWIN

3.1.1 Popup Window

X 214 🔶 N 98 🔶	Y 36 H 65	 Image: A main and a	Prev	iew
			(0×00-0	×FF)
Voice ID	0	🚖 s	egment	0
Name	Popu; O Upload	o Windo	w	
Button Effec	t Selec n Effect	t		
VP (0x)	0000) p#		
O High Byt) Dit		
O Low By	te			
Popup				
Image ID -1				
•				

DGUS_SDK User Guide V5.1

Selected Area: selected button area.

1010

Preview: preview button effect.

Name: name this button for viewing it in .xls (Excel) file.

Data Auto Upload: after pressing the button, key code auto sent to serial port.

Button Effect: set picture ID for touching effect, -1: null.

VP: variable pointer.

VAR Type:

INT: write key code in VP address (word).

High Byte: write low byte of key code in high byte of VP.

Low Byte: write low byte of key code in low byte of VP.

Bit: write data from last bit of key code into designated bit of VP address.

(0x10 corresponds to VP.0, 0x1F corresponds to VP.F).

Popup Window: set window picture ID and window area.

Image ID: image ID of window picture.

Cut Area: cut area in image ID.

Paste Position: position of window on current screen.

Note: Only <Touch Control> buttons will work on popup window.

Illustration of button <Popup Window>:



Click <Stop> button - Window pops up - Select YES/NO.



port.

3.1.2 Variable Data Input

		<u> </u>)×00-0	xFF)	
Voice ID	0	🚖 Seg	gment	0 {	×
Name D	ata Input				
🔲 Data Aut	to Upload				
Button Effe	ct				
-1 🎅	select				
No Butto	n Effect	-			
Jump To:		7			2
Jump To: -1 🔶	select				
Jump To:	select				
Jump To: -1 💮 No Jump VP (0x)	select 0				
Jump To: -1 💮 No Jum; VP (0x) VAR Type	select 0 00000				
Jump To: -1 🕞 No Jump VP (0x) VAR Type Number of IN	o 00000 INT F Bit]	8	×	
Jump To: -1 -	Select		8	A	

DGUS_SDK User Guide V5.1

Selected Area: selected button area. Preview: preview button effect. Name: name this button for viewing it in .xls file. Data Auto Upload: after pressing the button, key code auto sent to serial Button Effect: set picture ID for touching effect, -1: null. Jump To: switch to a new picture after pressing. **VP:** variable pointer. VAR Type: INT: integer. LONGINT: long integer. High byte: high byte in VP address. Low byte: low byte in VP address. Number of INT Bit: length of integer digits. Number of DEC Bit: length of decimal digits. Position: data position when typing. Font Color: data color when typing. Font ID: address of ASCII font file. Font Size: horizontal pixel numbers. Cursor Color: white/black cursor. Display Mode: masked by (*)/direct display. **Define Keyboard:** Set the keyboard picture ID and the keyboard area. Image ID: image ID of the keyboard area. Cut Area: cut area in image ID. Paste Position: position of the keyboard on current screen. **Enable VAR Input Limitation:**

noloc

Set limits for inputting numbers.

Notes: Only <Touch Control> buttons will work on keyboard: 0x00F1 (Confirm), 0-9 corresponds to 0x0030 - 0x0039, 0x00F0 (Cancel), 0x00F2 (Backspace), 0x002D (+/-), 0x002E (.).

Ignore decimal point while setting range restriction for return value. E.g.: the setting is 3 integer bits and 2 decimal bits, and then the top limit is 10000, rather than 100.

Inputted data can be displayed by <Data Variable>, <WordArt> etc.

 Professional, Creditable, Successful
 DGUS_SDK User Guide V5.1

 Ilustration of button < Variable Data Input>:
 DGUS_SDK User Guide V5.1

Click text – Keyboard pops up – Type data – OK. Click <Cancel> to interrupt input.

3.1.3 Incremental Adjustment

x 245 € y 33 {	Preview
	(0x00-0xFF)
Name Incremental	Adjustment
Data Auto Upload	
Button Effect]
VP (0x) 0000	
	Bit
O Low Byte	
Increment Type	~
Over-limit Operation	Stop 💌
Step Size	0
Minimum	

Selected Area: selected button area.

Preview: preview button effect.

Name: name this button for viewing it in .xls file.

Data Auto Upload: after pressing the button, key code auto sent to serial port.

Button Effect: set picture ID for touching effect, -1: null.

VP: variable pointer.

VAR Type:

0x00: integer.

0x01: high byte in VP address.

0x02: low byte in VP address.

0x10 - 0x1F: adjust value in designated bit of VP address. (0x10 corresponds to VP.0, 0x1F corresponds to VP.F) Step Size must be 0 or 1.

Adjustment Method: ++/--.

Over-limit Operation: stop/ cycle.

Step Size: set step size for +/- buttons.

Min. Value: minimum value for adjustment.

Max. Value: maximum value for adjustment.

Adjusted data can be displayed by <Data variable>, <Icon variable> and <WordArt> etc.

DGUS_SDK User Guide V5.1

Click <+> or <-> to adjust corresponding value. Hold the button to adjust continually.



3.1.4 Slider Adjustment

Selected Area: selected button area.

Preview: preview button effect.

Name: name this button for viewing it in .xls file.

Data Auto Upload: after pressing the button, key code auto sent to serial port.

VP: variable pointer.

Value Return Type:

0x00: integer.

0x01: high byte in VP address.

0x02: low byte in VP address.

Direction: horizontal/vertical.

Start Return Value:

The value corresponding to left/top side of slider.

Terminated Value:

The value corresponding to right/bottom side of slider.

This function is only for making touching area for slider. To display it, please use <Slider display> function.

Adjusted data can be displayed by <Data variable>, <Variable icon> etc.



Hold the button over 0.5 second and slide the slider to modify number in the right, the value will also be changed.

3.1.5 RTC

KEY CTRL	(0x00-0xFF)
Voice ID 0	Segment 0 {
Name RTC	
📃 Data Auto Upl	oad
Button Effect	
-1 📚 Se	elect
Display Position	0 , 0 Set
Display Position Font Color (0x)	0,0 Set
Display Position Font Color (0x) Font Lib_ID	0, 0 Set
Display Position Font Color (0x) Font Lib_ID Font Size	0, 0 Set
Display Position Font Color (0x) Font Lib_ID Font Size	0, 0 Set
Display Position Font Color (0x) Font Lib_ID Font Size Cursor Color	0, 0 Set 0,23-127 16 2 4-255 Black
Display Position Font Color (0x) Font Lib_ID Font Size Cursor Color Keyboard	0, 0 Set 0 0, 23-127 16 4-255 Black

Selected Area: selected button area. Preview: preview button effect. Name: name this button for viewing it in .xls file. Data Auto Upload: after pressing the button, key code auto sent to serial port. Button Effect: set picture ID for touching effect, -1: null. Display Position: data position when typing. Font Color: data color when typing. Font Lib_ID: address of ASCII font file. Font Size: horizontal pixel numbers. Cursor Color: white/black cursor. **Keyboard setting:** Set the keyboard picture ID and the keyboard area. Image ID: image ID of keyboard area. Cut Area: cut area in image ID. Paste Position: position of the keyboard on current screen. Notes: A keyboard setting is the same as <Data Input>. Use <RTC display> or <Analog clock display> to display current time.



Click <RTC> button - Keyboard Pops Up - Clock Sets Up the Current Time.

3.1.6 Basic Touch Control

x 235]
KEY CTRL (0x00-0xFF)	
Voice ID 0 😌 Segment 0	-
Name Basic Touch	
Button Effect -1 © Select No Button Effect Jump To: -1 © Select No Jump	
KeyValue Full Q/VER Keyboard 0x	
Notes: 'Basic Touch Control' refers numerical keypad, please value all numerical keys with following valid key code:	

Selected Area: selected button area. Preview: preview button effect. Name: name this button for viewing it in .xls file. Button Effect: set picture ID for touching effect, -1: null. Jump To: switch to a new picture after pressing. KeyValue: Only <Touch Control> button works on keyboard area.

Valid key code range: 0x0030 - 0x0039 (0-9), 0x002E (.), 0x002D (+/-), 0x00F0 (Cancel), 0x00F1 (Confirm), 0x00F2 (Backspace).

eycode									(
Leycode	Description	Keyo	ode						
0030				12	3	4	5	6	
0031			9			<u> </u>			Ь
0032			d	e	f	g	h	i	i
		k	1	m	n	0	P	q	r
		s	t	u	v	*	x	y	I
		1]	Í					1
		Fun	Spac	e mal) Keyc	ode		Enter	-
		C	ance	1	Retu	rn	Cap	sLoc	k
Delete S	elect Delete All 👚 🛃] [D.	elet	•	Lef	it	R	ight	
)ef Keyco	de 003C Add			Ē	acks	çace			
Descripti	on								
Sa	ve Select Cancel]							

DWIN

Professional, Creditable, Successful

3.1.7 Return Key Code

√ 59 🔮	Н 77				-
	₹L.	(0×00-0>	(FF)	
Voice ID	0	🚖 Se	gment	0	-
Name	Return Ke	ey Code			
📄 Data A	uto Upload				
Button Ef	fect	_			
-1	Selec	t			
No Bu	tton Effect				
Jump To:					
-1	Selec	t			
_					
No Ju	mp				
KeyValue					
					-
0x		Set	٦		
VP (0x) 0000	J			

DGUS_SDK User Guide V5.1

Selected Area: selected button area.

Preview: preview button effect.

Name: name this button for viewing it in .xls file.

Data Auto Upload: after pressing the button, key code auto sent to serial

port.

Button Effect: set picture ID for touching effect, -1: null.

Jump To: switch to a new picture after pressing.

KeyValue: self-defined keyValue for buttons.

VP: variable pointer.

VP Type:

Save in VP address.

Save in high byte of VP address.

Save in low byte of VP address.

Save in specified bit of VP address.

Illustration of button <Return Key Code>:



Set a <Return Key Code> button, of which VP is 0x000A, key value is 0x0005.



DGUS module auto uploads data 0005 to serial port as shown.

3.1.8 ASCII Input

	05			
KEY CTRL		(0×00-0>	(FF)
)	🚖 Se	egment	0 🊖
Name Te	ext Input	ĝ		7
🗌 Data Auto	Upload			
D. #				
-1	Select			
	00,001			
No Button	Effect			
- no batton				2
				31
Jump To	Select	_		Ĩ
Jump To	Select			_
Jump To -1 😭	Select			
Jump To -1 💽 No Jump VP (0x)	Select)		
Jump To -1 Decident No Jump VP (0x) Text Length	Select			
Jump To -1 (Solump) No Jump VP (0x) Text Length Input Mode	Select 0000 2 Re-I) D D D D		
Jump To -1 (Decident) No Jump VP (0x) Text Length Input Mode Font Lib_ID	Select 0000 2 Re-I 23) mput	0,23-12	27
Jump To -1 💽 No Jump VP (0x) Text Length Input Mode Font Lib_ID Font Vidth	Select 0000 2 Re-I 23 16	nput	0,23-12	27

Selected Area: selected button area. Preview: preview button effect. Name: name this button for viewing it in .xls file. Data Auto Upload: after pressing the button, key code auto sent to serial port. Button Effect: set picture ID for touching effect, -1: null. Jump To: switch to a new picture after pressing. VP: variable pointer. **Text Length:** length of text, by word, range from 1 to 123. Input Mode: re-input/ edit text. Font Lib_ID: address of ASCII font file. Font Width: horizontal pixel numbers. Font Height: vertical pixel numbers. Cursor Color: white/black. Font Color: data color when typing. Upload value as typing: tying status upload. Text Display Area: data position on screen when typing. Keyboard Displayed in: Current Page/Other Page. Keyboard Setting: Set the keyboard picture ID and the keyboard area. Image ID: image ID of the keyboard area. Cut Area: cut area in image ID. Paste Position: position of the keyboard on current screen. Note: Create <Touch control> buttons on keyboard to define the key code of the button (0x4161 indicates "A"). Inputted data can be displayed with <Text display> function.

W010m **DWIN** Professional, Creditable, Successful DGUS_SDK User Guide V5.1 Illustration of button <ASCII Input>: dwin dgus @ ? kspace Q W U Ε R Т Y 0 Ρ dele А S D F G Н J К caps lock L Ζ Х С V В Ν Μ ок ESC . 3.1.9 Firmware Parameter Settings Selected Area: selected button area. 🚔 Y 179 X 82 \$ Preview Preview: preview button effect. VV 44 🚔 H 51 -Name: name this button for viewing it in .xls file. KEY CTRL Data Auto Upload: after pressing the button, key code auto sent to (0x00-0xFF) serial port. Voice ID 0 Segment 0 -Button Effect: set picture ID for touching effect, -1: null. -Jump To: switch to a new picture after pressing. Name Parameter Config. Mode: setup mode. 📃 Data Auto Upload DataPack: data pack of setup. Setup Mode Button Effect -1 **e** Select No Button Effect Jump To -1 -Select No Jump 0 ٢ 0x00-0x07 Mode DataPack > -34





DGUS_SDK User Guide V5.1

Mod e	Data Pack	Description	Function
0x00	No	No	Transmit data from register to variable SRAM in 0x6F00 to 0x6FFF (low bytes).
0x01	No	No	Transmit data from address 0x6F00 to 0x6FFF in variable SRAM (low bytes) to register and reset module parameters including R1-R3, R5-RA.
	Tran_Area	Coordinates of top-left and bottom-right of area.	Convert designated area to monochrome bitmap (vertical mode) and save the data to designated VP address.
	*VP	VP address for restoring bitmap data.	 A. Width (Xe-Xs+1) should be even. B. Height (Ye-Ys+1) should be multiple of 8.
0x02	X=0 X=1 Y=0 D0.15 D0.7 Y=7 D0.8 D0.0 Y=8 D64.15 Y=15 D64.8	X=2 X=3 ···· X=126 X=127 D1.15 D1.7 D63.15 D63.7 D1.8 D1.0 D63.8 D63.0	 VP data format snown as below: VP: status indicator, refreshed to 0x5555 after operation. VP+1: horizontal length, by word. (Xe-Xs+1) &0xFFE/2 VP+2: numbers of data segment. (Ye-Ys+1) &0xFFF8/8 VP+3: bitmap data, with MSB priority. If the key code automatically upload is enabled (R2.3=1), module will upload message (value in VP address upload to 0x5555) to serial port. The command is mainly for printing of current screen.
0x03	*VP	Variable pointer.	Upload data in designated VP address to serial port.
0x04	Same function	with 0x03, uploading data t	o COM2 (reserved port).
0x05	Tran_Area *VP	Coordinates of top-left and bottom-right of area. VP address for restoring bitmap data.	Convert designated area to monochrome bitmap (horizontal mode) and save the data to designated VP address. A. Width (Xe-Xs+1) should be multiple of 16. B. VP data format as shown below: VP: status indicator, refreshed to 0x5555 after operation. VP+1: horizontal length, by word. (Xe-Xs+1) &0xFFF0/16 VP+2: numbers of data segment. (Ye-Ys+1) VP+3: bitmap data, with MSB priority. If the key code automatically upload is enabled (R2.3=1), module will upload message (value in VP address upload to 0x5555) to serial port. The command is mainly for printing of current screen.
	Frame_Head	Frame header (2byte)	Send the current touched position to COM2 (serial port for
0x06	Frame_End	Frame end (2byte)	reserving the system), the format is: Frame_Head + X + Y + Check (The cumulative Sum for 1 byte of X, Y) + Frame_end.



DGUS_SDK User Guide V5.1

3.1.10 Status sync-returned

114 🚔 H	102 🚖
KEY CTRL	(0x00-0xFF)
Voice ID 0	Segment 0
Name	Status sync-returned
Button Effect	t .
-1 🔶	Select
No Button	Effect
No Button	Effect
No Button) Effect
No Button Jump To	Select
No Button Jump To -1	Select
No Button Jump To -1	Select
No Button	Effect Select 0x00 0000 0000

Selected Area: (X, Y) are the top-left coordinates of icons.

Preview: preview VAR display effect.

Name: name this button for viewing it in .xls file.

010

TP_ON_Mode: commands returned with once touch.

TP_ON_CONTINUE_Mode: commands returned with freezing touch.

TP_OFF_Mode: commands returned with touch released.

Status sync-returned mode

Add.	Definition	Data Length	description
0X00	Pic_ID	2	Picture ID
0X02	TP_Area	8	The selected button area
0X0A	Pic_Next	2	Switch to a new picture after pressing,0XFF:null.
0X0C	Pic_On	2	Picture ID for touching effect,0XFF:null.
0X0E	TP_Code	2	0XFE08
0X10	0xFE	2	0XFE
0X11	TP_ON_Mode	1	Commands returned with one touch: 0X00=no commands returned; 0X01=read LEN1 length data from VP1S , and write to VP1T variable adds; 0X02=read LEN1 length data from VP1S, and write to the serial port; 0X03=read LEN1 length data from VP1S, and write to VP1T register.
0X12	VP1S	2	Reading data adds of the first touch on the touch screen.

Beijing DWIN Technology Co., Ltd.

DWIN



		•	63
IN for you Profession	onal, Creditable, Successful		DGUS_SDK User Guide
			- Writing adds of the first touch on the touch
0X14	VP1T	2	screen
0X16	0x00	40	0X00
			Length of the returning data(byte).
0X17	LEN1	1	0X01=LEN1 must be an even
			number.
0X18	0xFE	1	0XFE
			Commands returned with a freezing
			touch:
			0X00=no commands returned;
			0X01=read LEN2 length data from
0X19	TP_ON_Continue_Mode	1	VP2S , and write to VP2T variable adds;
			0X02=read LEN2 length data from
			VP2S , and write to the serial port;
			0X03=read LEN2 length data from
			VP2S, and write to VP2T register.
0X1A	VP2S	2	Reading data adds of the freezing touch
		-	on the touch screen.
0X1C	VP2T	2	writing data adds of the freezing touch on
			the touch screen.
0X1E	0x00	1	0X00
			Length of the returning data(byte).
0X1F	LEN2	1	0X01=LEN2 must be an even
0)/00			number.
0X20	UXFE	1	
			Commands returned with the button
			Is released:
			0X00-no commands returned,
0¥21	TP OFF Mode	1	VP3S and write to VP3T variable adds:
0,72,1			0X02=read LEN3 length data from
			VP3S and write to the serial port
			0X03=read LEN3 length data from
			VP2S, and write to VP3T register.
			Reading data adds when a button is
0X22	VP3S	2	released.
			writing data adds of the freezing touch on
0X24	VP3T	2	the touch screen.
0X26	0x00	1	0X00
			Length of the returning data(byte).
0X27	LEN3	1	0X01=LEN3 must be an even
			number.
0X28	0x00	8	Reserved,0x00 as d.

3.2 Variable Config.

3.2.1 Variable Icon

VV 39	H 54 😴
Name	VAR Icon
SP (0×)	FFFF
VP (0x)	0000
ICON File	<u> </u>
Minimum	
Icon ID	
Maximum	
Icon ID	
Display Mo	de Transparent 🔛
Initial Value	. 0 😴
Demonstr	ration
Delay 50) 🕞 ms Strat

Selected Area: (X, Y) are the top-left coordinates of icons.

molC

Preview: preview VAR display effect.

Name: name this button for viewing it in .xls file.

SP: stack pointer, default setting is 0xFFFF.

Set SP to load description data into variable SRAM.

0xFFFF: load description data from configuration file.

VP: variable pointer.

ICON File: address of icon file.

Min/Max value: limits of variables, null if over limit. Icon ID:

Icon address in icon file corresponding to the min/max value.

Display Mode: transparent/background.

Initial Value: Set the initial value & save it in the 22 config file, the system will be initiated according to 22 config file when the DGUS is started.

Illustration of variable <Variable Icon>:



Change the value in VP address to display different icons.

DGUS_SDK User Guide V5.1

DWIN

Professional, Creditable, Successful

3.2.2 Animation Icon

Name	Animation	icon	
SP (Ox)	FFFF		
√P (0x)	0000		
V_Stop	0		
V_Start	0		
ICON File			~
ICON_Stop	0	۵ 🕻	
ICON_Start	0	2	
ICON_End	0		
Display Mod	le		
Tra	ansparent		~
Initial Value		0	-
Demonstra	ation		
Delay 50	e n	ns Start	



Selected Area: (X, Y) are the top-left coordinates of icons.

Preview: preview VAR display effect.

Name: name this button for viewing it in .xls file.

SP: stack pointer, default setting is 0xFFFF.

VP: variable pointer.

V_Stop: set value to stop animation.

V_Start: set value to start animation.

ICON File: address of icon file.

ICON Stop: icon at V_stop value.

lcon_Start/lcon_End:

Start/end icon for animation at V_start Value.

ICON Display Mode: transparent/background.

Initial Value: Set the initial value & save it in the 22 config file, the system will be initiated according to 22 config file when the DGUS is started.

Illustration of variable <Animation Icon>:

When value in VP address is 0, screen display icon 0:



When value in VP address is 9, animation starts.



DWIN

Professional, Creditable, Successful

3.2.3 Slider

Name	Slide	er Display
SP (0x)	FFFF	-
VP (0x)	0000)
Initial Value		0
Terminated Va	alue	0
Slider Mode	Horiz	zontal 💽
ICON File		~
ICON ID	0	a
Display Mode		Transparent
Y Coordinatel		163 🌻
(X)Coordinate	offse	nt 0
VAR Type	Wor	rd 💌
Initial Value		0

Selected Area: (X, Y) are the top-left coordinates of icons. X, W is start/end point of horizontal slider. Y, H is start/end point of vertical slider. Preview: preview VAR display effect. Name: name this button for viewing it in .xls file. SP: stack pointer, default setting is 0xFFFF. **VP:** variable pointer. Start/End Value: value corresponding to start/end point. Slider Mode: horizontal/vertical. ICON File: address of icon file. ICON ID: icon address in icon file. Display Mode: transparent/background. **Coordinate Offset:** Offset to the left/top. VAR Type: Integer (whole VP address). High byte in VP address. Low byte in VP address.

Initial Value: Set the initial value & save it in the 22 config file, the system will be initiated according to 22 config file when the DGUS is started.

Note: Set same VP address for <Slider> button and <Slider display> variable to combine them. <Slider display> is also used as progress bar.



Send command to serial port:Frame header, Length, Command, VP, Data string to display the Slider and Data above.A5 5A0582000C002C

Beijing DWIN Technology Co., Ltd.

DGUS_SDK User Guide V5.1



DGUS_SDK User Guide V5.1

3.2.4 WordArt

Name V	VordArl	t variab	le	
SP (0x)	FFF]	
/P (0x)	000			
con_Lib				~
		-	_	
COND 0 The sequence correspondin	of Ic g to C	con_ID	that	
COND 0 The sequence correspondin con_Mode Transpar	of Ic g to C ent	con_ID) is	that	~
COND 0 Conrespondin Con_Mode Transpar /P_Data_Mode	of Ic g to (ent	con_ID) is	that	~
COND 0 The sequence correspondin con_Mode Transpar /P_Data_Mode nt_Num	of Ic g to C ent	on_ID) is	that	
COND 0 The sequence correspondin con_Mode Transpar VP_Data_Mode nt_Num Dec_Num	ent	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	that	> > 4>
COND 0 The sequence correspondin con_Mode Transpar /P_Data_Mode nt_Num Dec_Num klignment	ent	NT Elign Le	that	 >

Selected Area: (X, Y) are the top-left coordinates of icons.

Preview: preview VAR display effect.

Name: name this button for viewing it in .xls file.

SP: stack pointer, default setting is 0xFFFF.

VP: variable pointer.

ICON File: address of icon file.

ICON 0: icon address corresponding to number 0.

ICON Display Mode: transparent/background.

VAR Type: integer/long integer.

Number of INT/DEC bit: length of integer/decimal digits.

Initial Value: Set the initial value & save it in the 22 config file, the system will be initiated according to 22 config file when the DGUS is started.

Illustration of variable <WordArt >:



Send command to serial port:

Frame header, Length, Command, VP, Data string to display the WordArt above.A5 5A05820CCC0017

DWIN

Professional, Creditable, Successful

DGUS_SDK User Guide V5.1

3.2.5 Image Animation

K 76 🚔 Y	153 🚖	Preview	
/V 57 🚔 H	61 🚔	-	
Name Image	Animation		
SP (0x)	FFFF		
Start Image ID	0	*	
End Image ID	0	×	
Image Switching	; Time:		
1	🚖 (x 8m	is)	

Selected Area: (X, Y) are the top-left coordinates of icons.

010

Preview: preview VAR display effect.

Name: name this button for viewing it in .xls file.

SP: stack pointer, default setting is 0xFFFF.

Start Image ID: select starting picture of animation.

End Image ID: select ending picture of animation.

Image Switching Time:

Select switching speed for animation, by every 8ms.

Start image ID should be less than end image ID.

Set a <image animation> on end image to loop.

Send commands or set <touch control> button to interrupt animation.



3.2.6 Icon Rotation

Name	Icon Rol	tation	
SP (Ox)	FFFF		
VP (0x)	0000		
ICON File			~
ICON ID	0	÷	0
ICON Rotatio	on Center:		
X 0	😴 Y	0	-
Upper-left co in centre of r	oordinate w	/ill be po the defi	ositioned ault.
Upper-left co in centre of i Initial VAR	oordinate w	vill be po the defi 0	ositioned ault.
Upper-left co in centre of r Initial VAR End VAR	oordinate w	vill be po the defi 0	ositioned ault.
Upper-left co in centre of i Initial VAR End VAR Initial Rotatio	pordinate w rotation as	vill be po the defi 0 0 0	ositioned autt.
Upper-left co in centre of i Initial VAR End VAR Initial Rotation	pordinate w rotation as on Angle n Angle	vill be po the defi 0 0 0	ositioned autt.
Upper-left co in centre of r Initial VAR End VAR Initial Rotatio End Rotation Rotation An 0-720(0x00	oordinate w rotation as on Angle n Angle gle : 00-0x2D0),	vill be po the defi 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	bositioned autt.
Upper-left co in centre of r Initial VAR End VAR Initial Rotation End Rotation Rotation An 0-720(0x00	oordinate w rotation as on Angle n Angle gle : 00-0x2D0),/ łe	vill be po the defi 0 0 0 0 0 0 0 0	ositioned autt.

Selected Area: (X, Y) are the coordinates of rotating center.

Preview: preview VAR display effect.

Name: name this button for viewing it in .xls file.

SP: stack pointer, default setting is 0xFFFF.

VP: variable pointer.

ICON File: address of icon file.

ICON ID: icon address in icon file.

ICON Rotation Center:

Select rotation center (X, Y) for the icon.

Initial/End VAR Value:

Value corresponding to start/end angle, null if over limit.

Initial/End Rotation Angle:

Select start/end angle, ranging from 0 to 720, by every 0.5 $^\circ\,$.

Display Mode: transparent/background.

VP_Mode:

Integer (whole VP address).

High byte in VP address.

Low byte in VP address.

Initial Value: Set the initial value & save it in the 22 config file, the system will be initiated according to 22 config file when the DGUS is started.

Send serial commands or press buttons to change value in VP address, and then to adjust the angle of pointer.

Illustration of variable <Icon Rotation >: Icons file for rotation:





Frame header, Length, Command, VP, Data string to display the ICON above.A5 5A0582000A0084

DGUS_SDK User Guide V5.1



3.2.7 Data Variable

lame	Data Display
P (0x)	FFFF
′P (0x)	0000
ext Color(0x)	F800
ont Lib_ID	23 🞅 0,23-127
ont Size	16 🞅 4-255
lignment Mode:	Left 💌
AR Type	INT 💽
it_Num	8
ec_Num	0
nit Length	0
nit Displayed	
Unit Text	(Max. 11 Characters)

Selected Area: (X, Y) are the top-left coordinates of data. **Preview:** preview VAR display effect.

Name: name this button for viewing it in .xls file.

SP: stack pointer, default setting is 0xFFFF.

VP: variable pointer.

Font Color: data color.

Font Lib_ID: address of ASCII font file.

Font Size: horizontal pixel numbers.

Alignment Mode: Right/Left /Centered.

VAR Type:

0x00: integer.

0x01: long integer.

0x02: high byte in VP address.

0x03: low byte in VP address.

Number of INT Bit: length of integer digits.

Number of DEC Bit: length of decimal digits.

Unit Length:

Corresponding to displayed unit automatically.

Unit Displayed:

ASCII unit for data, max length is 11 bytes.

Initial Value: Set the initial value & save it in the 22 config file, the system will be initiated according to 22 config file when the DGUS is started.

Send commands or set buttons to modify displayed data.

Illustration of variable <Data Variable>:



Send command to serial port:

Frame header, Length, Command, VP, Data string to display the Data (left-up) above.A5 5A058200000022

DWIN

Professional, Creditable, Successful

3.2.8 Text Display

x 247 🔮 W 51 🔮	Y 174 Preview H 48
Name	Text
SP (Ox)	FFFF
VP (0x)	0000
Text Colori	(0x) F800
Encoding	Mode 0x00=8bit 🖌
📄 Set C	haracter Interval MANUALLY
Text Lengt	h 2
FONT0_ID	0
Font ID of f	he ASCII in Coding
FONT1_ID	23
Font ID of non-ASCI	coding 0x00- 0x05 and in coding 0x01-0x04
Dot Matrix	in X-direction
	16 🚔 4-255
Dot Matrix	in Y-direction
	16 会 4-255

DGUS_SDK User Guide V5.1

Selected Area: (X, Y) are top-left coordinates of data.

Textbox is the selected area.

Preview: preview VAR display effect.

Name: name this button for viewing it in .xls file.

SP: stack pointer, default setting is 0xFFFF.

VP: variable pointer.

Text Color: data color.

Encoding Mode:

0x00: 8bit encoding, 0x01: GB2312, 0x02: GBK, 0x03:BIG5, 0x05: UNICODE.

Set Character Interval MANUALLY: on/off.

Text Length: select text length, by byte.

Font0_ID: address of ASCII font file.

Font1_ID: address of non-ASCII font file.

Dot Matrix in X/Y-direction: select font size. Please note that parameter should be the same with the size of font file.

Horizontal/Vertical Separation:

Pixel distance in Horizontal/Vertical.

Initial Value: Set the initial value & save it in the 22 config file, the system will be initiated according to 22 config file when the DGUS is started.

Illustration of variable <Text Display>:



Send command to serial port:

Frame header, Length, Command, VP, Data string to display the Text (bottom-left) above.A5 5A0D82000864 77 69 6E 20 64 67 75 73 76





3.2.9 Digital RTC Display

Name	RTC	
SP (Ox)	FFFF	
Font Color	F800	
Font Lib_ID	23	
Font Size	16 🚖 (4-255)	
Date Format		
Y-M-D H:Q:	SW	
Y-M-D H:Q: Coding Strin coding list a RTC Coding:	SW g, It is consisted of RTC nd ASCII	
Y-M-D H:Q: Coding Strin coding list a RTC Coding: Content	SW g, It is consisted of RTC nd ASCII Coding	
Y-M-D H:Q: Coding Strin coding list a RTC Coding: Content Year	SW g, It is consisted of RTC nd ASCII Coding Y	
Y-M-D H:Q: Coding Strin coding list a RTC Coding: Content Year Month	SW g, It is consisted of RTC nd ASCII Coding Y M	
Y-M-D H:Q: Coding Strin coding list a RTC Coding: Content Year Month Day	SW g, It is consisted of RTC nd ASCII Coding Y M D	
Y-M-D H:Q: Coding Strin coding list a RTC Coding: Content Year Month Day Hour	SW g, It is consisted of RTC nd ASCII Coding Y M D H	
Y-M-D H:Q: Coding Strin coding list a RTC Coding: Content Year Month Day Hour Minute	SW g, It is consisted of RTC nd ASCII Coding Y M D H Q	
Y-M-D H:Q: Coding Strin coding list a RTC Coding: Content Year Month Day Hour Minute Second	SW g, It is consisted of RTC nd ASCII Coding Y M D H Q S	

Selected Area: (X, Y) are the top-left coordinates of data.

Preview: preview VAR display effect.

Name: name this button for viewing it in .xls file.

SP: stack pointer, default setting is 0xFFFF.

Font Color: data color.

Font Lib_ID: address of ASCII font file.

Font Size: horizontal pixel numbers.

Date Format: refer to the red texts in picture in the left.

Use <RTC> button to modify current time.

Ilustration of variable <Digital RTC Display> (Digital clock on bottom-right of screen):





3.2.10 Analog Clock Display

346	386 🔄 Preview 49 📚
Name	Clock Display
SP (0x)	FFFF
The center of a left-up coordina Also the interse H/Q/S arms.	nalog clock is the ite of chosen area. ecting point of
ICON File	×
Hide Hour H	Hand
ICON Hour	FFFF 🚖 🚱
Center Coord	inate 0,0
	Hand
Center Coordin	nate 0,0
Hide Secon	hand Hand
ICON Second	FFFF 🔮 👩
Center Coordin	nate 0,0
13	

DGUS_ K, Y) are the rotating center coc

DGUS_SDK User Guide V5.1

Selected Area: (X, Y) are the rotating center coordinates.
Preview: preview VAR display effect.
Name: name this button for viewing it in .xls file.
SP: stack pointer, default setting is 0xFFFF.
ICON File: address of icon file.
Analog Clock:
ICON Hour: select hour hand ID in icon file.
Center Coordinate: rotation center in icon.
Minute Hand:
ICON Minute: select minute hand ID in icon file.
Center Coordinate: rotation center in icon.
Second Hand:
ICON Second: select second hand ID in icon file.
Center Coordinate: rotation center in icon.

Illustration of variable <Analog Clock Display>:

Beijing DWIN Teo	chnology Co., Ltd.	Click here to watch animation again
11 12 1 2 9 3 8 7 6 5	Data Input Animation Text Input Ta	Dashboard Curve Graph
		2012-08-20 09:07:01 MON

DWIN

Professional, Creditable, Successful



3.2.11 Dynamic Trend Curve

Name Curve Dis	play
SP (0x) FFFF	
Y_Central 0	
VD_Central 0	
Curve Color(0x)	
MUL_Y	
Magnification in vertio unit is 1/256,0x0000-0	al, the ×7FFF
Data Source Channel	0
	(0x00-0x07)
	1
Horizontal Axis Spacing	9 ' 💌

Selected Area: select window area, null if over range.

Preview: preview VAR display effect.

Name: name this button for viewing it in .xls file.

SP: stack pointer, default setting is 0xFFFF.

Y_Central: select center line of trend curve.

VD_Central:

Trend curve value at center line, normally average of Max & Min value.

Curve Color: select color for trend curve.

MUL_Y: magnification in Y direction, by every 1/256.

Data Source Channel: select channel for trend curve.

Horizontal Spacing:

Transverse spacing between sampling points.

Illustration of variable <Dynamic Trend Curve Display>:



Send command to serial port:

Frame header, Length, Command, Data channel, Data string to display the trend curve above.A5 5A1884010800 0700 0710 0733 0800 0800 08000800 0900 0908 0906

DWIN

Professional, Creditable, Successful

3.2.12 Table Display

Name	Table Disp	lav	
SP (0x)	FFFF		
VP (0x)	0000		
Column Num	ber	1	-
Row Numbe	r.	1	-
Start Display	Column	1	-
Start Display	Row	1	-
Unit_Data_N	um(Ox)	0	٢
When Unit_E for the conte (TAB_X_Nur E.g. *VP=0x1 then, 0x1000 data length ii low byte of 0 therefore the	Data_Num=(ent of the ta n /2) bytes 1000, TAB_ 0-0x1003 s nformation 0x1003 is n e content of)x00, th ble will (Upwa X_Star equenti of Row of occu the tal	te address be shifted rd round). t=0x07 ally stored 0-6, the upied, ble will be

Encoding Mode	0x00=8bit	~
Set Character	Interval MANU	ALLY
Direct indicatio	n	

DGUS_SDK User Guide V5.1

Selected Area: select table area, null if over range.

Preview: preview VAR display effect.

Name: name this button for viewing it in .xls file.

SP: stack pointer, default setting is 0xFFFF.

VP: variable pointer, starting address of the data in table.

Column/Row Number: set the size of table.

Start Display Column/Row:

Select starting column/row to be displayed.

Unit_Data_Num:

0x01-0x7F: length of data for one cell.

0x00: data in VP address defines the length of each column.

When Unit_Data_Num is 00, starting address of data will be (Row number/2,

round up to integer) backward from VP address.

Encoding Mode:

0x00: 8bit, 0x01: GB2312, 02: GBK, 03: BIG5, 04: SJIS, 05: UNICODE.

Set Character Interval MANUALLY: on/off.

Boarder Color: select table boarder color.

Text Color: select text color.

FONT0_ID: address of ASCII font file.

FONT1_ID: address of none-ASCII font file.

X/Y-Direction Size:

Select font size, accordant with width of fonts in font file.

Column Header: Valid Display/Invalid Display.

Row Header: Valid Display/Invalid Display.

Data for table can be loaded by 22.bin file. Refer to DGUS document for detailed instruction.

Illustration of variable <Table Display>:



Drofoo	aianal Cradi	table. Cusessof	
Profes	sional, Credi	table, Successi	ui
	Carlos and		
	111111	CAR SHE	
K600+	65K	800*490	
K600+	65K	640*480	
K600+	65K	1024*768	
K600+	65K	800*480	
K600+	65K	1024*600	
K600+	65K	800*600	
K600+	65K	1024*768	
K600+	65K	1024*768	
K600+	65K	800*600	
All the second and a second	112313111 - 113	States Addition	

DGUS_SDK User Guide V5.1

If the length of data is shorter than designated, please use 0xFFFF as end mark of data in this cell. For oversized table, users can use slider to pull the table.

3.2.13 Basic Graphic Display

P (0x) FFFF P (0x) 0000 Dotted Line se command of drawing segment 0x02,0x03,0x09,0x0A) for dotted ne. Format of Dotted Line 1 (1-255) 1 (1-255) 1 (1-255) 1 (1-255) 1 (1-255) 1 (1-255)	ame	Basic	Graphic	
P (0x) 0000 Dotted Line se command of drawing segment 0x02,0x03,0x09,0x0A) for dotted ne. Format of Dotted Line 1 (1-255) 1 (1-255) 1 (1-255) 1 (1-255) 1 (1-255) 1 (1-255) 1 (1-255)) (0x)	FFFF		
Dotted Line se command of drawing segment 0x02,0x03,0x09,0x0A) for dotted ne.	P (Ox)	0000		
se command of drawing segment 0x02,0x03,0x09,0x0A) for dotted he. Format of Dotted Line 1 (1-255) 1 (1-255) 1 (1-255) 1 (1-255)	Dotted	Line		
1 (1-255) 1 (1-255) 1 (1-255) 1 (1-255) 1 (1-255)	0x02,0x0 ne. Format of	3,0x09,0	0x0A) for	dotted
1 (1-255) 1 (1-255) 1 (1-255) 1 (1-255)	1		(1-255	5)
1 (1-255) 1 (1-255)	1		(1-255	5)
1 💽 (1-255)	1	-	(1-255	5)
	1	-	(1-255	5

Selected Area: select window area, null if over range. (Limit is only effective for 0x0001 - 0x0005 commands). Name: name this button for viewing it in .xls file. SP: stack pointer, default setting is 0xFFFF. VP: variable pointer.



String Format

DWIN

Address	Definition	Description
VP	CMD	Command
VP+1	Data_Pack_Num_Max	Data Pack Number
VP+2	DATA Pack	

Data Pack for Basic Graphic

Professional, Creditable, Successful

		Description of Data Pack Format, by word			, by word
CMD	Function	Relative Address	Length	Definition	Description
0×0001	Det	0x00	2	(x, y)	Dot coordinates.
0,0001	DOI	0x02	1	Color	Dot color.
		0x00	1	Color	Line color.
0,0002	Line	0x01	2	(x, y)0	Vertex 0 coordinates.
0x0002	LIIIE	0x03	2	(x, y)1	Vertex 1 coordinates.
		0x01+2*n	2	(x, y)n	Vertex n coordinates.
		0x00	2	(x, y)s	Top-left coordinates.
0x0003	Rectangle	0x02	2	(x, y)e	Bottom-right coordinates.
		0x04	1	Color	Rectangle's color.
	Destand	0x00	2	(x, y)s	Top-left coordinates.
0x0004	Area Fill	0x02	2	(x, y)e	Bottom-right coordinates.
Alea Fill	0x04	1	Color	Filled color.	
		0x00	2	(x, y)	Circle center coordinates.
0x0005	0x0005 Circle	0x02	1	Rad	Radius of circle.
		0x03	1	Color	Circle color.
		0x00	1	Pic_ID	Image ID of cutting area.
	Picture	0x01	2	(x, y)s	Top-left coordinates of the cutting area.
0x0006	cut/paste	0x03	2	(x, y)e	Bottom-right coordinates of the cutting area.
		0x05	2	(x, y)	Paste position on current screen.
		0x00	2	(x, y)	Top-left coordinates of icon.
0x**07	lcon Display	0x02	1	ICON_ID	Icon ID in icon file, high byte of command specifies address of icon file, display mode is transparent.
0,0008	Aroa fill	0x00	2	(x, y)	Sampling dot coordinates.
0,0000		0x02	1	COLOR	Filled color.
		0x00	1	Color0	
0,0000	Vortical line	0x01	1	X0	Connect (X0, X0a) (X0, X0a) with color 0
0x0009	verticar line	0x02	1	Y0s	
		0x03	1	Y0e	

Judging condition:

0xFF: finish operation,

0xFE: skip to next step.



Send command to serial port:

Frame header, Length, Command, Address, Controlling bytes, Data pack, Coordinate, ColorA5 5A118220 0000 0300 0100 64 00 64 02 8C 01 90F8 00To get the rectangle above.



String Format

Address	Definition	Description
VP	CMD	Command
VP+1	Data_Pack_Num_Max	Data Pack Number
VP+2	DATA_Pack	

Data pack for Special Industrial Application

CMD	Function	Description	of data pa	ack format, by	word
CIND		Relative Address	Length	Definition	Description
		0x00	1	Color0	Color of "Safe Zone".
		0x01	1	Color1	Color of normally overlapped area (Overlapped once).
		0x02	1	Color2	Color of High-Risk overlapped area (Overlapped twice or more).
	0x0001 Ox0001 Overlapped Area of Multiple Circles Fill	0x03	1	Color3	Color of circles.
0x0001		0x04	1	Color4	Color of evasion.
		0x05	4	Disp_Area	Display area, null if over range.
		0x09+4*n	2	(x, y)n	Center coordinates of No. n.
		0x0B+4*n	1	RADn_1	The bigger radius of No. n concentric circles.
		0x0C+4*n	1	RAD2n_2	The smaller radius of No. n concentric circles.

Beijing DWIN Technology Co., Ltd.



DGUS_SDK User Guide V5.1



(26 V 24	Y 259
Name	Bit icon
SP (Ox)	FFFF
VP (0x)	0000
AP (Ox)	
Bit Icon O	N (1) / OFF (0): 111111111
	Set
Disp. Mod	le 0x00 💉
Align Mod	le 0x00 💌
Interval	0
Icon File II	D 🖌
ICON0S	0 😂 🚱
ICON0E	0 🗢 🔂
ICON1S	0 😤 🚱
ICON1E	0 😌 🚱
Display Mo	ode Transparent 🔽
Initial Valu	e 0 🔶

Selected Area: (X, Y) are coordinates of top-left of icons.

Preview: preview VAR display effect.

Name: name this button for viewing it in .xls file.

SP: stack pointer, default setting is 0xFFFF.

VP: variable pointer.

AP: substitutive variable pointer, reserved 2 words.

Bit Icon ON (1) /OFF (0): define BITs to display.

Disp. Mode: shown as the following table.

Align Mode:

0x00: X++, space unreserved for undesignated bits. 0x01: Y++, space unreserved for undesignated bits. 0x02: X++, space reserved for undesignated bits. 0x03: Y++, space reserved for undesignated bits.

Interval: spacing between icons.

Icon File ID: address of icon file.

ICON0S:

Icon ID for bit0 in non-animation mode, or starting

Icon ID for bit0 in animation mode.

ICON0E: ending icon ID for bit0 in animation mode.

ICON1S:

Icon ID for bit1 in non-animation mode, or starting Icon ID for bit1 in animation mode.

ICON1E: ending icon ID for bit1 in animation mode.

ICON Mode: Transparent/Opaque.

Initial Value: Set the initial value & save it in the 22 config file, the system will be initiated according to 22 config file when the DGUS is started.



DGUS_SDK User Guide V5.1

Professional, Creditable, Successful

DWIN

Diaplay Mada	Value of bit			
Display_wode	0	1		
0x00	ICON0S	ICON1S		
0x01	ICON0S	Null.		
0x02	ICON0S	Animation: ICON1S - ICON1E.		
0x03	Null.	ICON1S		
0x04	Null.	Animation: ICON1S - ICON1E.		
0x05	Animation: ICON0S - ICON0E.	ICON1S		
0x06	Animation: ICON0S - ICON0E.	Null.		
0x07	Animation: ICON0S - ICON0E.	Animation: ICON1S - ICON1E.		

Illustration of variable <Bit Icon> (on bottom of screen):



DGUS_SDK User Guide V5.1

3.2.16 Timer Variable

DWIN

Name	Time VAR
SP (Ox)	FFFF
VP (Ox)	0000
Color	F800
Font Lib ID	23 🞅 0,23-127
Font Size	16 🚔 4-255
Data length (Bytes) 1 🚖
ASCII Separa	itors
	Convert
Hex Separa	itors
	movestove styling used to

Selected Area: (X, Y) are the top-left coordinates of data.

Preview: preview VAR display effect.

Name: name this button for viewing it in .xls file.

SP: stack pointer, default setting is 0xFFFF.

VP: variable pointer.

Color: data color.

Font Lib ID: address of font file, 8bit encoding half-width.

Font Size: font size in X-direction.

Data length (Bytes): byte numbers to be displayed.

ASCII Separators: data string.

Convert: convert ASCII Separators into Hex Separators.

Encoded separators string, used to define the format of Timer. Every time a Timer data (BCD code) is read, one ASCII char will be added after as separator.

Some special chars: 0x00: none, Timer data will be concatenated; 0x0D: new line.

Illustration of variable <Bit Icon> (on top-right of screen):





3.2.17 RollText

x 84 🗼 Y W 50 🗼 H	66 42		Preview
Name Ro	ollTe	xt	
SP (0x)		FFFF	
VP (0x)		0000	
Text Color(0x)		F800	
Encoding Mode	•	0×00=8bi	t 💌
Set Charact	er Ir	iterval MA	NUALLY
Roll-in Mode	0	×00	~
Roll-in Space	0		x
Alignment	0	x00=Left	~
FONT0_ID	0		
Font ID of the A	sci	l in Coding	g L
FONT1_ID	2	:3	
Font ID of codin non-ASCII in co	ng 0: Iding	×00- 0×05 ; 0×01-0×	5 and 04
Dot Matrix in X	-dir	ection	



Selected Area: (X, Y) are the top-left coordinates of data. Preview: preview VAR display effect. Name: name this button for viewing it in .xls file. SP: stack pointer, default setting is 0xFFFF. VP: variable pointer. Text Color: data color. **Encoding Mode:** 0x00: 8bit encoding, 0x01: GB2312, 0x02: GBK, 0x03:BIG5, 0x05: UNICODE. Set Character Interval MANUALLY: on/off. **Roll-in Mode:** 0X00=right to left 0X01=left to right 0X02=top to bottom 0X03=bottom to top Roll-in Space: pixels to roll in each DGUS period. Alignment: centered, left-aligned, right-aligned, top-aligned, button-aligned, equal width, equal height. Font0_ID: address of ASCII font file. Font1_ID: address of non-ASCII font file. Dot Matrix in X/Y-direction: select font size. Please note that parameter should be the same with the size of font file. Horizontal/Vertical Separation:

,010

Pixel distance in Horizontal/Vertical.

Initial Value: Set the initial value & save it in the 22 config file, the system will be initiated according to 22 config file when the DGUS is started.





4. Commands

4.1 Data Frame

is st Serial data frame is constituted with 5 parts as shown in chart below:

Data Block	1	2	3	4	5
Definition	Frame header	Data length	Command type	Data string	CRC checksum
Data Length	2	1	1	Ν	2
Description	Defined by R3 and RA parameter in config.txt	Including command type, data string and CRC checksum	0x80-0x84		Enabled by R2 parameter in config.txt

4.2 Command Set

Function	CMD	Data	Description				
	0x80	ADR(0x00-0xFF)+Data_Pack	Write data in particular address of register				
Access Register	0v81	ADR(0x00-0xFF)+ RD_LEN(0x00-0xFF)	Read data in particular address of register				
	0.001	ADR(0x00-0xFF)+RD_LEN+ Data_Pack	Response of DWIN LCD module				
A	0x82	ADR_H:(0x0000-0x6FFF)+DAT A0 +DATAn	Write data in particular address of variable SRAM				
Variable		ADR_H: L(0x0000-0x6FFF)+ RD_LEN(0x00-0x7F)	Read data in particular address of variable SRAM				
SRAM	0x83	ADR_H: L+RD_LEN+DATA0+ DATAn	Response of DWIN LCD module				
Trend Curve Buffer	0x84	CH_Mode(Byte)+DATA0(Word)++ DATAn	Write trend curve buffer. CH_Mode defines the channels of data : > Each bit in CH_Mode corresponds to one channel. > CH_Mode. 0 corresponds to channel 0. > Low channel ranges ahead. > E.g.: CH Mode=0x83(10000011B), > data format like "CH7+CH1+CH0"				

Register is accessed by every byte, variable SRAM and trend curve buffer is accessed by word.

4.3 Register

Register, 256 bytes, is used for hardware operation and process control.

Register Address	Definition	Length (Byte)	Description
0x00	Version	1	DGUS version number, BCD code, 0x10 indicates V1.0.
0x01	LED_NOW	1	LED brightness, 0x00-0x40.
0x02	BZ_TIME	1	Buzzer beeping time, by every 10ms.
0x03	PIC_ID	2	Read: read current picture ID. Write: switch to specific picture ID.
0x05	TP_Flag	1	0x5A: there is update of touching area. Others= no updating. TouchPanel data is no longer updated if user did not clear the flag

Beijing DWIN Technology Co., Ltd.





DGUS_SDK User Guide V5.1

			after data retrieving.				
0x06	TP_Status	1	0x01: first click. 0x03: pressing down. 0x02: uplift pressing. Others: null.				
0x07	TP_Position	4	Coordinate of touching position: X_H:L, Y_H:L.				
0x0B	TPC_Enable	1	0x00: disable the touchPanel. Others: enable the touchPanel. Default setting: 0xFF.				
0x0C-0x0F	Reserve	4	Undefined.				
0x10-0x1A	R0-RA	11	Mapping of SD card config. register, read only.				
0x1F	RTC_COM_ADJ	1	0x5A: RTC data is rewritten through serial port, cleared after RTC auto updating.				
0x20	RTC_NOW	16	YY:MM:DD:WW:HH:MM:SS				
Send serial con written as any	mmand to modify cur day you choose.	rent time, e.g	j.: A5 5A 0A 80 1F 5A 12 10 25 0412 00 01. "04" means Th	ursday, it can be			
0x30-0x3F	Reserve	16	Undefined.				
0x40	En_Lib_OP	1	0x5A: applying writing in font flash memory, clear after operation.				
0x41	Lib_OP_Mode	1	0x50: Transfer data from variable SRAM to font flash memory. 0xA0: Transfer data from font flash memory to variable SRAM.				
0x42	Lib_ID	1	Designate font address for data exchange. Total space are 16MB, font space: 0x40-0x7F, maximum space of every font is 128KW.				
0x43	Lib_Address	3	Designate address in font library for data exchange. Sp (word) address for data operation in font storage, 0x00:00:	becified the first 00-0x01:FF:FF.			
0x46	VP	2	Designate variable SRAM addresses for data exchange. S (word) address for data operation in font storage, 0x00:00-	pecified the first 0x6F:FF.			
0x48	OP_Length	2	Length of exchanged data, by word.				
Save 1KW va command: A5	riable data string sta 5A 0C 80 40 5A 50 4	rting from 02 0 00 00 00 10	x1000 address into #64 font ID with starting 0x0000 addr 0 00 02 00.	ess, send serial			
0x4A	Timer0	2	16-bit software timer, in term of 4ms, auto-decrement to 0.				
0x4C	Timer1	1	8-bit software timer, in term of 4ms, auto-decrement to 0.	Maximum error is			
0x4D	Timer2	1	8-bit software timer, in term of 4ms, auto-decrement to 0. +/_4ms.				
0x4E	Timer3	1	8-bit software timer, in term of 4ms, auto-decrement to 0.				
0x4F	Key_code	1	Address of key code for 13 touch control config. file, 0. Clear after operation executed.	x00: null.			
0x50-0xFF	Reserve	182	Undefined.				

Register is accessed by command 0x80/0x81.

DGUS Register Space: 0x00H-0xFFH, is written / read by byte.

DGUS Variable Data Memory Space: 0x0000H-0x6FFFH, is written / read by word.

Data in Curve buffer is written / read by word.

The communication between DGUS LCMs & Controllers (MCU) are driven by Variables that you may read and write in corresponding address.



4.4 VP & SP

4.4.1 VP (Variable Pointer)

4.4.1.1 About VP

VP is the initial address of variables in variable SRAM (56KB) which separated into 28672 pcs of memory spaces from 0x0000 to 0x6FFF occupying two bytes for each below. (High bytes and Low bytes)

echnolo



The communication between DGUS LCMs and host is oriented by variables that you may read or write in corresponding address. Reading &Writing of initial address and variable length could be changed via Command 0x82&0X83 if known in advance.

4.4.1.2 How to use VP?

Assign VP for each variables

Each variable should be assigned a VP, yet overlap is not allowed. The value of the variable will be saved from the VP. For example, variable 1 as a long integer saved in 0x1001 while variable 2 as an integer have to be stored on another address preventing 0x1001 and 0x1002 from conflicts with variable 1.





DGUS_SDK User Guide V5.1

Set VP via DGUS_SDK

DWIN

For example, display and input a variable (No. 100) which is an integer. The VP of this variable is 0x1000.







Supposing that reading & writing to the same one, touch and input parameters of VP should be the same accordingly.

4.4.2 SP (Stack Pointer)

4.4.2.1 About SP

SP is the initial address for saving variable attributes which described features of the variables, such as font color, font size and unit of variables, etc. The variable attributes refers to the Chapter Five of DGUS Dev. Guide.

Ad	dress	Definition	Data Length	Description			
0x00		0x5A10	2				
0x02		*SP	2	Stack pointer, default setting is	s 0xFFFF (set by Config. file).		
0x04		0x000D	2	The whole process length (in	terms of words).		
0x06	0x00	*VP	2	Variable pointer.			
0x08	0x01	X, Y	4	Top-left coordinate of text string.			
0x0C	0x03	COLOR	2	Text color.			
0x0E	0x04:H	Lib_ID	1	Address of font file.			
0x0F	0x04:L	Font_X_Dots	1	Horizontal pixel numbers.			
0x10	0x05:H	ALI	1	0x00: right-aligned, 0x01: left-	aligned, 0x02: centered.		
0x11	0x05:L	Int_Num	1	Length of integer digits.			
0x12	0x06:H	Dec_Num	1	Length of decimal digits.	The sum should be less than 20.		
0x13	0x06:L	VP_Data_Mo de	1	VP mode. 0x00: integer (2 bytes). 0x01: long integer (4 bytes). 0x02: high byte in VP address 0x03: low byte in VP address. 0x04: double long integer (8 b 0x05: unsigned integer (2 byte 0x06: unsigned long integer (4	-32768 - 32767 -2147483648 - 2147483647 0 - 255 0 - 255 ytes)9223372036854775808 - 9223372036854775807 as). 0 - 65535 4 bytes). 0 - 4294967295		
0x14	0x07:H	Len_unit	1	Length of unit. 0x00: without unit.	, Su		
0x15	0x07:L	String_Unit	Max11	Unit data, by ASCII code.			

SP shares the same SRAM with VP from 0x0000 to 0x6FFF. It is only used for variable display but overlap exception.





Change variable attributes via SP

Same sample as above:

DWIN

In operation, if user attempts to do the changes on data color to red, just need able to write down a new value into corresponding address.

MOION

	Ad	dress	Definition	Data Length	Description			
	0x00		0x5A10	2				
	0x02		*SP	2	Stack pointer, default setting i	s 0xFFFF (set by Config. file).		
	6x84	x5000	0:000D	2	The whole process length (in	terms of words).		
	0x06	0x00	*VP	2	Variable pointer.			
The col	010x08	sangol	X , Y	4	Top-left coordinate of text strin	ng.		
n 0x500	30x0C	0x03	COLOR	2	Text color.			
	0x0E	0x04:H	Lib_ID	1	Address of font file.			
	0x0F	0x04:L	Font_X_Dots	1	Horizontal pixel numbers.			
	0x10	0x05:H	ALI	1	0x00: right-aligned, 0x01: left-	aligned, 0x02: centered.		
	0x11	0x05:L	Int_Num	1	Length of integer digits.	The sum should be loss than 20		
	0x12	0x06:H	Dec_Num	1	Length of decimal digits.	The sum should be less than 20.		
	0x13	0x06:L	VP_Data_Mo de	1	VP mode. 0x00: integer (2 bytes). 0x01: long integer (4 bytes). 0x02: high byte in VP address 0x03: low byte in VP address. 0x04: double long integer (8 b 0x05: unsigned integer (2 byte 0x06: unsigned long integer (4 byte).	$\begin{array}{c} -32768-32767\\ -2147483648-2147483647\\ s. 0-255\\ 0-255\\ ytes)9223372036854775808-9223372036854775807\\ es). 0-65535\\ 4 \ bytes). 0-4294967295 \end{array}$		
	0x14	0x07:H	Len_unit	1	Length of unit. 0x00: without unit.			
	0x15	0x07:L	String_Unit	Max11	Unit data, by ASCII code.			

Frame header (2 Bytes)+Data length (1 Byte)+Command (1 Byte)+Data (N Byte: ADR+data/LEN)+CRC (2 Bytes, optional) Send:5A A5 05 82 50 03 F8 00 Description: 5003: the address of color F800: the value of red color

4.5 Examples

Configure frame header and baud rate in CONFIG.TXT via DGUS SDK as below: R1=07 R3=5A

RA=A5



Frame header (2 Bytes)+Data length (1 Byte)+Command (1 Byte)+Data (N Byte: ADR+data/LEN)+CRC (2

DWIN			10 <u>9</u> ,
ideal partner for you Profe	essional, C	reditab	le, Successful DGUS SDK User Guide V
51 Access	Register	of DG	
Switch current	Data Into	Regis c_3:	ster
Prote > Registr	essional, Creditable,	Successful	
A 256B regis Register	ter is designed fo	Length	e setting and process control. Refer to the table below:
Address 0x00	Version	(Byte) 1	DGUS version number, BCD code, 0x10 indicates V1.0.
0x01	LED_NOW	1	LED brightness, 0x00-0x40.
0x02	BZ_TIME	1	Buzzer beeping time, by every 10ms
0x03	PIC_ID	2	Read: read current picture ID. Write: jump to appointed picture ID.
0x05	TP_Flag	1	Ox5A: there is update of touching coordinates. Others= no updating. Touchpanel data is no longer updated if user did not clear the flag after data reading.
			0x01: first click. 0x03: pressing down
Send: <mark>5</mark> Descripti	A A5 <mark>(</mark> on: 03:) <mark>4</mark> 80 Register	0 <mark>03 00 03</mark> r for Picture ID
<mark>0(</mark>	<mark>) 03:</mark> Appoi	int pictur	re ID

Register	Definition	Length (Byte)	Description
0x00	Version	1	DGUS version number, BCD code, 0x10 indicates V1.0.
0x01	LED_NOW	1	LED brightness, 0x00-0x40.
0x02	BZ_TIME 1		Buzzer beeping time, by every 10ms.
0x03	PIC_ID	2	Read: read current picture ID. Write: jump to appointed picture ID.
			0x5A: there is update of touching coordinates.

01: Read data by a byte

4.5.1.3 Response from the DGUS module

Receive:	5A	A5	04	81	<mark>00</mark>	01	<mark>47</mark>	
Descriptio	n:	47:	The	versi	on is	47 (V 4.7)	



4.5.2 Access Variable SRAM

4.5.2.1 Write Data into variable SRAM

Write Data 100 to VP=0x0010



4.5.2.2 Read Data from variable SRAM

Send:	5A	A5	<mark>04</mark>	83	00	10	01	
Description: 0010: Variable pointer								
01: Read data by a word								

4.5.2.3 Response from the DGUS module

 Receive:
 5A
 A5
 05
 83
 00
 10
 01
 00
 20

 Description:
 0020:
 Data 32 in hexadecimal format

 4.5.3 Dynamic Trend Curve Display

 Send:
 5A
 A5
 12
 84
 12
 00 32 00 72 00 9F 00 04 00 17 00 36 00 93 00 1A

 Description:
 12:
 Channel 4 & Channel 1, 8bit(0001 0010)



4.5.4 Basic Graphic Display

String Format		
Address	Definition	Description
VP	CMD	Command.
	Data Daak Num Max	Max number of data packs.
VP+1	Data_Pack_Null_Max	For command 0x0002, it's number of graph.
VP+2	DATA_Pack	

Date Pack For Basic Graphic

		Description of Data Format, by word								
CMD	Function	Relative Address	Relative Data Address Length		Description					
0x0001	Det	0x00	2	(x, y)	Coordinate of dot.					
00001	DOI	0x02	1	Color	Color of dot.					
		0x00	1	Color	Color of line.					
0x0002	Lino	0x01	2	(x, y)0	Coordinate of vertex 0.					
	LINE	0x03	x03 2		Coordinate of vertex 1.					
		0x01+2*n 2		(x, y)n	Coordinate of vertex n.					
0x0003		0x00	2	(x, y)s	Coordinate of top-left.					
	Rectangle	0x02	2	(x, y)e	Coordinate of bottom-right.					
		0x04	1	Color	Color of rectangle.					
	Destangle	0x00	2	(x, y)s	Coordinate of top-left.					
0x0004		0x02	2	(x, y)e	Coordinate of bottom-right.					
	Alea Fill	0x04	1	Color	Filled color.					
		0x00	2	(x, y)	Coordinate of center of circle.					
0x0005	Circle	0x02	1	Rad	Radius of circle.					
		0x03	1	Color	Color of circle.					
0,0006	Picture	0x00	1	Pic_ID	Image ID of cutting area.					
0,0000	Cut/Paste	0x01	2	(x, y)s	Coordinate of top-left of cutting area.					

Beijing DWIN Technology Co., Ltd.





DGUS_SDK User Guide V5.1

		0x03	2	(x, y)e	Coordinate of bottom-right of cutting area.						
		0x05	2	(x, y)	Paste position on current screen.						
		0x00	2	(x, y)	Coordinate of top-left of icon.						
0x**07	lcon Display	0x02	1	ICON_ID	Icon ID in icon file, high byte of command specifies address of icon file, display mode is transparent						
		0x00	2	(x v)	Coordinate of sampling dot						
0x0008	Area Fill	0x02	2	Color	Filled color						
		0x00	1	Color0							
	Vertical	0x01	1	XO	_						
0x0009		0x02	1	Y0s	Connect (X0, Y0s), (X0, Y0e) with color0.						
		0x03	1	Y0e							
	0	Description of	of Data Forr	mat. by word							
CMD	Function	Relative Data		Definition	Description						
	· ·	Address	Length		·						
0x0001	Dot	0x00	2	(x, y)	Coordinate of dot.						
		0x02	1	Color	Color of dot.						
		0x00	1	Color	Color of line.						
0x0002	Line	0x01	2	(x, y)0	Coordinate of vertex 0.						
		0x03	2	(x, y)1	Coordinate of vertex 1.						
		0x01+2*n	2	(x, y)n	Coordinate of vertex n.						
	Rectangle	0x00	2	(x, y)s	Coordinate of top-left.						
0x0003		0x02	2	(x, y)e	Coordinate of bottom-right.						
		0x04	1	Color	Color of rectangle.						
0x0004	Rectangle	0x00	2	(x, y)s	Coordinate of top-left.						
	Area Fill	0x02	2	(x, y)e	Coordinate of bottom-right.						
		0x04	1	Color	Filled color.						
		0x00	2	(x, y)	Coordinate of center of circle.						
0x0005	Circle	0x02	1	Rad	Radius of circle.						
		0x03	1	Color	Color of circle.						
		0x00	1	Pic_ID	Image ID of cutting area.						
0x0006	Picture	0x01	2	(x, y)s	Coordinate of top-left of cutting area.						
	Cut/Paste	0x03	2	(x, y)e	Coordinate of bottom-right of cutting area.						
		0x05	2	(x, y)	Paste position on current screen.						
	Icon	0x00	2	(x, y)	Coordinate of top-left of icon.						
0x**07	Display	0x02	1	ICON_ID	Icon ID in icon file, high byte of command specifies address of icon file, display mode is transparent.						
		0x00	2	(x, y)	Coordinate of sampling dot.						
0x0008	Area Fill	0x02	1	Color	Filled color.						
		0x00	1	Color0							
	Vertical	0x01	1	X0							
0x0009	Line	0x02	1	Y0s	Connect (X0, Y0s), (X0, Y0e) with color0.						
		0x03	1	Y0e							

Status Flag:

0xFF Current drawing operation finished.

0xFE This operation will be skipped (ignored).

DWIN

Professional, Creditable, Successful



DGUS_SDK User Guide V5.1

Take Circle Drawing for example



1) Add a basic graphic display via DGUS SDK software and set vp to 0x00A0 as below:



2) Send commands by serial port

1		_			_		-			_			_											
				0x00			2		(x, y)			Circle center coordinates.												
	0x0005	0x0005 Circle			0x02			1		Rad			Radius of circle.											
					0x03			1 C		Color		Ci	Circle color.											
					~																			
S	end:	5A	A5	11	82	00	A0	00	05	00	01	01	64	00	EF	00	64	F8	00	FF	00			

DWIN Null partner for your Professional, Creditable, Successful



DGUS_SDK User Guide V5.1

	Hex	Description						
	5A A5	Frame header						
	11	Data length						
	82	Command						
	00 A0	VP						
	00 05	Circle command						
	00 01	One circle						
	01 64	X coordinate of center of circle:356						
0	00 EF	Y coordinate of center of circle:239						
	00 64	Radius of circle:100						
	F8 00	Color: red						
	FF 00	Drawing operation finished						